

T04D01 – (4.1) Ionic Bonding

Name.....

1. 4.1.1 Describe the ionic bond as the electrostatic attraction between oppositely charged ions. (2)
 - a. What is an anion, what is a cation?

 - b. Define an Ionic Bond:

 - c. How is ionic different than covalent?

2. 4.1.2 Describe how ions can be formed as a result of electron transfer. (2)
 - a. Using Sodium and Chlorine as an example, illustrate and explain the electron transfer that occurs as an ionic bond is formed between the two:

 - b. Illustrate the formation of an ionic bond between lithium and fluorine:

 - c. Illustrate the formation of an ionic bond between calcium and fluorine:

3. 4.1.3 Deduce which ions will be formed when elements in groups 1, 2 and 3 lose electrons. (3)
 - a. What charged ion do elements in groups 1,2, and 3 form? Explain why using concepts of periodicity:

4. 4.1.4 Deduce which ions will be formed when elements in groups 5, 6 and 7 gain electrons. (3)
 - a. What charged ions do elements in groups 5, 6, and 7 form? Explain why using concepts of periodicity:

5. 4.1.5 State that transition elements can form more than one ion. (1)
 - a. Explain why transition elements have various oxidation states:

 - b. How do we address the various states in ionic nomenclature?

6. 4.1.6 Predict whether a compound of two elements would be ionic from the position of the elements in the periodic table or from their electronegativity values. (3)
- What are the ranges for determining bonding type based on electronegativity:
 - Non-polar Covalent:
 - Polar Covalent:
 - Ionic:
 - Describe what is meant by ionic character and how even covalent compounds can have ionic character:
 - Illustrate three scenarios:
 - The representation of a non-polar bond:
 - The representation of charge differences in a polar bond:
 - The representation of charge differences in an ionic bond:
7. 4.1.7 State the formula of common polyatomic ions formed by non-metals in periods 2 and 3. (1)
- Draw the structure and give the name for 8 common polyatomic ions:
 - Describe how an molecule (containing polyatomic ions) can be both ionic and covalent:
8. 4.1.8 Describe the lattice structure of ionic compounds. (2)
- How do the three aspects of ionic bonding help to create lattice structures for solid ionic compounds?
 - The shape and form of a lattice structure depends on what factors?
 - Draw the lattice structure of NaCl (include at least one degree of the “z” dimension):
 - What two aspects determine the strength of an ionic bond:
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